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EXAMINER

SULLIVAN, DANIEL M

ART UNIT PAPER NUMBER

1636

DATE MAILED: 03/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/778,516

Applicant(s)

LO ET AL.

Examiner

Daniel M Sullivan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-14 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

This Non-Final Office Action is a response to the “Response to Office Action...” and exhibits A and B filed 23 December 2002 (Paper No. 17) in reply to the Non-Final Office Action mailed 24 August 2002 (Paper No. 15). Claims 1-14 were considered in Paper No. 15. Claims 10, 12, 13 and 14 were amended in Paper No. 17. Claims 1-14 are pending and under consideration herein.

#### ***Response to Amendment***

Rejection of claims 1-12 and 14 under 35 U.S.C. § 112, first paragraph, as lacking enablement is withdrawn in view of Applicant’s arguments of record in Paper No. 17. Although the disclosure is not enabling for claims directed to a vaccine composition comprising a Lac shuttle vector, the vector itself can be used to express proteins of interest in eukaryotic cells *in vitro*, which has well-established utility in the art.

Claim 13 stands rejected under 35 U.S.C. § 112, first paragraph, as lacking enablement for reasons of record in Paper No.’s 7 and 15 and herein below in the “Response to Arguments”.

Rejection of claims 1, 12 and 14 under 35 U.S.C. § 112, second paragraph, as indefinite is withdrawn in view of the amendments to the claims in Paper No.’s 9 and 17.

#### ***Response to Arguments***

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In response to the Examiner's arguments of record regarding enablement of claim 13, Applicant argues, "not everything necessary to practice an invention need be disclosed and all that is necessary is that one skilled in the art be able to practice the claimed invention, given the level of knowledge and skill in the art. Genes encoding antigens capable of inducing immune responses against diseases can be found in the art. For example, AFP is one of such genes. Methods of determining the efficacy of a vaccine are also known in the art...Another well known example of an antigen-encoding gene is the hepatitis B virus surface antigen (HBsAg) gene...Although some genes may encode antigens unable to induce protective immune responses, the presence of these genes does not constitute sufficient ground for non-enablement rejection...whether a Lac shuttle vector carrying a gene encoding an antigen would be effective in inducing a protective immune response can be evaluated based on the knowledge and methods well known in the art" (page 6).

These arguments have been fully considered but are not found persuasive. Applicant is arguing that because the art teaches some examples of DNA vaccines and methods by which one of skill in the art could evaluate whether a given embodiment of the claimed subject matter would be useful, the claim to a DNA vaccine composition is fully enabled. To support this argument, Applicant cites *Atlas Powder Co. v. E.I. du Pont de Nemours & Co* (224 USPQ 409, 414; hereinafter *Atlas*) which states in part, "the presence of inoperative embodiments within the scope of the claim does not necessarily render a claim nonenabled. The standard is whether a skilled person could determine which embodiments that were conceived, but not yet made, would be inoperative or operative with expenditure of no more effort than is normally required in the art." However, *Atlas* also provides, "[o]f course, if the number of inoperative combinations

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becomes significant, and in effect forces one of ordinary skill in the art to experiment unduly in order to practice the claimed invention, the claims might indeed be invalid” (page 414).

Applicant's arguments fail to take into account the enormous scope of the claims, directed to a vaccine composition comprising any and all antigenic genes, and the teachings of the prior art, cited in previous office actions, which indicate that the majority of the embodiments encompassed by the claim would be inoperative. Therefore, determining which embodiments that were conceived, but not yet made, would be inoperative or operative would clearly require expenditure of more effort than is normally required in the art.

### *New Grounds for Rejection*

#### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6, 10 and 12-14 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

*Vas-Cath Inc. v. Mahurkar*, 19USPQ2d 1111, clearly states that “applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of *the invention*. The invention is, for purposes of the ‘written description’ inquiry, *whatever is now claimed*.” (See page 1117.) The specification does not “clearly allow persons of

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ordinary skill in the art to recognize that [he or she] invented what is claimed.” (See *Vas-Cath* at page 1116).

The instant claims 1-3, 5, 6, 10 and 12-14 are directed to a Lac shuttle vector comprising “a nucleic acid sequence encoding a protein which is involved in replication of the lactic acid bacteria plasmid”. The claims thus encompass a Lac shuttle vector comprising a genus of nucleic acid sequences encoding proteins involved in replication of a lactic acid bacteria plasmid. The Guidelines for Written Description state “The claimed invention as a whole may not be adequately described if the claims require an essential or critical element which is not adequately described in the specification and which is not conventional in the art” (Federal Register, Vol. 66, No. 4, Column 3, page 71434). In the instant case, the nucleic acid sequence encoding a protein involved in replication of a lactic acid bacteria plasmid is a critical element of the Lac shuttle vector as the claims are explicitly limited to a vector comprising a nucleic acid sequence having that function. Therefore, the instant disclosure must describe the genus of nucleic acid sequences encoding proteins involved in replication of a lactic acid bacteria plasmid such that the skilled artisan would recognize that Applicant was in possession of the full scope of the genus. The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species, by actual reduction to practice, reduction to drawings, or by disclosure of relevant identifying characteristics (see MPEP 2163 (ii)). The disclosure provides a single example of a nucleic acid sequence encoding proteins involved in replication of a lactic acid bacteria plasmid (i.e. Rep A) and reduces that example to practice. Beyond that, the disclosure identifies the genus only by a statement of function. However, an adequate written description of a DNA requires more than a mere statement that it is part of the

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invention and reference to a potential method for isolating it; what is required is a description of the DNA itself. It is not sufficient to define DNA solely by its principal biological property, i.e. it encodes a protein involved in replication of a lactic acid bacteria plasmid, because disclosure of no more than that, as in the instant case, is simply a wish to know the identity of any DNA with that biological property. Also, naming a type of material generically known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material. Thus, claiming all DNA's that achieve a result without defining what means will do is not in compliance with the description requirement. Rather, it is an attempt to preempt the future before it has arrived. (See *Fiers v. Revel*, 25 USPQ2d 1601 (CA FC 1993) and *Regents of the Univ. Calif. v. Eli Lilly & Co.*, 43 USPQ2d 1398 (CA FC, 1997)).

In addition, claims 1-4, 10 and 12-14 are directed to a Lac shuttle vector comprising a marker gene that is not an antibiotic resistance gene. The limitation of "a marker gene that is not an antibiotic resistance gene" is again a critical element of the claimed subject matter that comprises a genus of divergent species of genes. The instant disclosure provides a single example of a marker gene having the recited function (i.e.  $\beta$ -galactosidase) and reduces that example to practice. However, for the reasons provided above regarding the inadequate description of the genus of nucleic acid sequences encoding proteins involved in replication of a lactic acid bacteria plasmid, the disclosure also fails to demonstrate possession of the full scope of the claimed subject matter as it encompasses *any* and *all* a marker genes that are not antibiotic resistance genes.

In view of these considerations, a skilled artisan would not have viewed the teachings of the specification as sufficient to show that the applicant was in possession of the claimed

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invention commensurate to its scope because it does not provide adequate written description for the broad class of marker genes that are not an antibiotic resistance genes or nucleic acid sequences encoding proteins involved in replication of a lactic acid bacteria plasmid. Therefore, only the described species of  $\beta$ -galactosidase and a nucleic acid encoding Rep A meet the written description provision of 35 U.S.C. §112, first paragraph.

Claims 1, 7, 8, 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite in its recitation of “the promoter sequence thereof” in step (d). It is unclear from the claim language how the promoter sequence is related to the marker gene. The limitation could be interpreted to mean that the promoter sequence must be the native promoter for the selected marker gene. However, it is more likely that Applicant intends that the promoter be any promoter sequence regardless of whether that promoter is related or unrelated to the marker gene. If the latter were intended, amending the claim such that it is directed to a marker gene operably linked to a promoter sequence, would clarify the claim.

Claims 7 and 8 are indefinite in that they encompass a “degenerate variant” of a vector. In the art, a degenerate variant usually refers to sequences that differ at the nucleic acid level but encode the same protein. In the instant case, the vectors comprise many segments that do not encode polypeptide sequences; therefore it is unclear whether the nucleic acid sequence of the vectors encompassed are identical except for those portions encoding a polypeptide, or if they might vary outside of the coding sequences. Clarification is requested.



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Claims 10 and 11, as it depends from claim 10, are indefinite in the recitation of "the host cell" in the first line of claim 10. There is no antecedent basis for a host cell in claim 1, from which claim 10 depends.

### *Allowable Subject Matter*

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel M Sullivan whose telephone number is 703-305-4448. The examiner can normally be reached on Monday through Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Remy Yucel, Ph.D. can be reached on 703-305-1998. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-9105 for regular communications and 703-746-9105 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.


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March 6, 2003



**JAMES KETTER  
PRIMARY EXAMINER**